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REDUCED BY MANIPULA-
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BY

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A REPORT OF THIRTY-ONE CASES OF CONGENITAL DISLOCATION OF THE HIP JOINT REDUCED BY MANIPULATION.

By EDVILLE GERHARDT ABBOTT, A.B., M.D.,

PORTLAND, ME.

THE object of publishing this report is not to present any radical departure from the familiar method of reducing congenital dislocations of the hip-joint by manipulation, but merely to place the work on record.

The ages of the patients varied from two to thirteen years, and, as usual, the greater number were females. Twenty-nine cases were unilateral and two were bilateral. The operation performed was the same as that described by Lorenz, with the exception that, in some instances, the plaster-of-Paris spica was extended below the knee in order to better control the after position of the limb. (Whitman: Orthopedic Surgery.) In three cases weight-traction was used preliminary to the reduction.

CASE I. Girl, two years of age, dislocation of left hip, three-fourths of an inch shortening. The reduction was easily accomplished, and a plaster dressing applied, which was worn for four months. The successive spicas were applied at intervals of three months, the limb being lowered each time until it was brought to a normal position at the end of two years. Examination at that time showed limbs of equal length, slight eversion of the foot due to a twist in the neck of the femur, and slight limp.

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Subsequent examination, one year later, showed some improvement in the eversion of the foot, gait normal, and the joint in an anatomical position.

CASE II. Girl, three and one-half years of age, dislocation of the right hip, shortening $1\frac{1}{4}$ inches. Reduction was accomplished with some difficulty, and, owing to the shallowness of the acetabulum, the replacement was very insecure. At the first change of the plaster spica it was noticed that the head of the bone had slipped forward beneath the anterior inferior spinous process. There was, however, so little shortening that no attempt was made to replace the head within the acetabulum. Spicas were worn for eight months with a final result as follows: One-third inch shortening, very slight limp, and anterior displacement of the head.

CASE III. Girl, three years of age, dislocation of both hips, marked lordosis, extremely awkward gait. Reduction was readily accomplished, and the patient was removed from the Maine General Hospital in a few days. The child was of an extremely nervous temperament, and some member of the family removed the spica in a short time. The result was an anterior displacement of both hips, with marked improvement in the gait.

CASE IV. Girl, nine years of age, dislocation of the left hip, shortening one inch and three-fourths. Reduction was accomplished with much difficulty, as the patient was well developed. Spicas were worn for eighteen months, with a result as follows: One-third inch shortening, nearly normal gait, and anatomical position of the joint correct. Subsequent examination some four years later showed joint in position with improvement.

CASE V. Girl, age eleven, dislocation of the left hip, one and one-half inches shortening. In this patient preliminary extension was employed, and re-

duction was easily made at first attempt. Plaster spicas were worn for twenty months, with the following results: One-third inch shortening, very slight limp, and head of femur firmly held in the acetabulum.

CASE VI. Boy, four and one-half years of age, dislocation of the right hip, shortening three-fourths of an inch. Reduction easily accomplished, but the acetabulum was found to be very shallow, and it was with great difficulty that the joint was held in position while the plaster was applied. The first spica was worn for six months, and, when removed, the head of the bone was found to be again dislocated posteriorly. Another operation was advised and performed with a final result of an anterior dislocation. The gait was so nearly normal, however, that nothing further was attempted.

CASE VII. Girl, aged eight years, dislocation of the left hip, shortening one inch, extreme intoeing. Reduction was easy, and joint very secure afterwards. Patient wore spicas for sixteen months with a final result as follows: one-fourth of an inch shortening, normal gait, and joint in correct position.

CASE VIII. Girl, eleven years of age, dislocation of the left hip, shortening one and one-fourth inches. Reduction was accomplished with difficulty after repeated attempts, and the joint was very unstable. When the first spica was changed, the joint was found to be dislocated again posteriorly. Another reduction was made, but at the next change of plaster the bone was found anterior to the acetabulum. Nothing further was attempted in this case, as the gait was much improved and the condition of the patient at the time did not warrant another operation.

CASE IX. Boy, six years of age, dislocation of

the right hip, shortening one inch. The capsule of the joint in this case was extremely lax, and it was possible to replace the head without an anesthetic, but the muscles were so shortened that the limb could not be placed in a favorable position, therefore it was necessary to administer ether. The acetabulum had but little depth, and considerable difficulty was experienced in holding the joint in a normal position while the plaster was applied. Successive spicas were worn for sixteen months, with a marked improvement over the first condition, but the joint was not in an anatomical position. An open operation was repeatedly advised, but refused.

CASE X. Girl, aged eighteen months, dislocation of the left hip, shortening three-fourths of an inch. Reduction was easily accomplished and limb placed in plaster. At the end of six months the joint was so firmly fixed in a normal position that the spicas were discontinued. The result was the best obtained in this series of cases. The shortening was less than one-fourth of an inch, and the gait at the end of the first year after operation was normal.

CASE XI. Girl, three and one-half years of age, dislocation of the left hip, shortening one inch, marked twist in the neck of the femur. Reduction was made with some difficulty, as the capsule prevented the head from easily entering the socket. Plaster in this case was worn for eighteen months. The result was good, with the head in the correct position. Eversion of the foot was pronounced after the foot was brought to a normal position, but two years later this deformity was much less apparent.

CASE XII. Girl, eleven years of age, dislocation of the right hip, shortening one and one-half inches, with considerable deformity of the head. Reduction was accomplished with much difficulty, and the joint was easily displaced upon the slightest motion. Pa-

tient was kept in plaster for twenty-two months, with a final result as follows: Shortening one-fourth of an inch, slight eversion of the foot, and joint in an anatomical position.

CASE XIII. Girl, aged seven years, dislocation of the right hip, shortening three-fourths of an inch. Reduction was easily accomplished, and the limb placed in plaster, where it was kept for seventeen months. Final result was good: Normal gait, joint in anatomical position, and slight eversion of the foot.

CASE XIV. Girl, aged twelve years, bilateral dislocation. Preliminary traction was made for ten days. Reduction was accomplished with difficulty in the right hip, but the best result that could be obtained in the left was an anterior position. The limbs were fixed in plaster for twenty months, with a final result as follows: Normal joint on the right side, and an anterior position on the left. There was shortening of one-half inch in the left limb, which caused a slight limp. The lordosis, which was extreme before the operation, entirely disappeared.

CASE XV. Girl, aged eighteen months, dislocation of the left hip, shortening less than one-half inch. Reduction was easily accomplished, and the first spica was removed at the end of the fourth month. The joint was so firmly fixed that it did not seem necessary to apply another. This proved to be a fact, with a final result of a perfectly normal condition. Subsequent examination two years later showed joint in position with both limbs of the same length.

CASE XVI. Boy, twelve years of age, dislocation of the right hip, shortening one and one-half inches. An attempt was made to reduce the hip without any preliminary traction, as the child could not remain in this vicinity for any length of time. It was

impossible to make a reduction by manipulation, and the cutting operation was refused. The limb was placed in the abducted position and held by a spica with the hope that an anterior displacement would be the final result. He passed from observation, however, and his present condition is unknown through examination, but a recent letter from his parents, which states that his gait is much improved, leads one to believe that the expected result was obtained.

CASE XVII. Girl, four years of age, dislocation of the right hip, shortening one-half inch. The acetabulum was well formed and reduction was easily made. Spicas were worn for thirteen months with the following result: Limb normal in length, joint in anatomical position, and gait free from limp.

CASE XVIII. Boy, seven years of age, dislocation of the right hip, shortening one inch. The head of the bone was deformed and the neck twisted. Reduction was accomplished without much difficulty. The patient remained in plaster twenty months with the following result: Joint in anatomical position, slight shortening with corresponding limp, and marked eversion of the foot. An osteotomy was advised to correct the eversion, but was refused.

CASE XIX. Girl, two and one-half years of age, dislocation of the left hip, shortening one-half inch. Reduction was easily made, but it was with difficulty maintained. At the first change of plaster it was found that the head had slipped from the acetabulum, and another reduction was made. The patient was kept in plaster for fifteen months, with a final result as follows: Limb the same length as its fellow, joint in normal position, and gait showed no limp.

CASE XX. Girl, eight years of age, dislocation of the right hip, shortening one and one-half inches, head of the bone much deformed. Reduction was

very difficult, and the stability of the joint not good. At the first change of plaster the head of the bone was found in an anterior position, but it was not considered best to attempt another replacement; so the plaster spicas were continued with the following result: One-half inch shortening, slight limp, and head in the anterior position.

CASE XXI. Boy, aged twelve years, dislocation of the right hip, shortening one and three-fourths inches. Preliminary traction could not be obtained in this case; so the reduction was attempted without it, and accomplished with considerable difficulty. There was much bruising of the tissues, and marked discoloration followed the operation. Sloughing did not follow, however, but the joint dislocated again, and another attempt to better the condition was not allowed.

CASE XXII. Girl, aged three years, dislocation of the right hip, shortening three-fourths of an inch. Reduction was easily accomplished, but the acetabulum was so shallow that the joint was very insecure. Spicas were worn for fifteen months with the following result: Limbs of equal length, no limp, and joint in the correct position.

CASE XXIII. Girl, nine years of age, dislocation of the right hip, shortening one and one-fourth inches. Preliminary traction was used for nine days in this case. Reduction was accomplished with much difficulty, but the joint was exceptionally stable. Spicas were worn for eight months with the following result: Slight shortening of the limb, anatomical position of the joint, and slight limp.

CASE XXIV. Girl, aged twenty months, dislocation of the left hip, shortening one-half inch. Reduction was easily made. A spica was worn for four months, and, as the *x*-ray showed the head of the bone well situated, the plaster was discontinued.

Massage and passive motion were commenced immediately. An examination one year later showed the limbs of equal length, joint in position, no limp.

CASE XXV. Girl, thirteen years of age, dislocation of the right hip, shortening one and one-half inches. Preliminary traction was used in this case for two weeks. Reduction was accomplished with much difficulty, but the joint was very secure. Plaster was worn for eighteen months, with a final result as follows: Joint in correct position, one-third inch shortening, and slight limp.

CASE XXVI. Boy, four and one-half years of age, dislocation of the right hip, shortening three-fourths of an inch. Reduction was easily accomplished, but as neither the acetabulum nor the head of the bone were well formed it was very difficult to hold the joint in normal position while plaster was applied. Spicas were worn for twenty months, and the final result was as follows: One-third inch shortening, slight limp, and joint in the correct position.

CASE XXVII. Girl, aged ten years, dislocation of the right hip, shortening one and three-fourths inches. Reduction was accomplished with extreme difficulty, and the head of the bone slipped from the acetabulum with the slightest movement toward adduction. At the first change of the plaster it was found that the head was anteriorly displaced. It was not considered advisable to attempt to make another replacement. Subsequent examination showed the following result: One-half inch shortening, slight limp, and joint dislocated anteriorly.

CASE XXVIII. Girl, aged six years, dislocation of the left hip, shortening one inch. The *x*-ray showed the acetabulum and the head of the bone to be in nearly normal condition. Reduction was made with great difficulty, but the joint was very stable. Plaster was worn for eighteen months, with a final

result as follows: One-fourth inch shortening joint in correct position, normal gait.

CASE XXIX. Boy, nine years of age, dislocation of the left hip, shortening one and one-fourth inches. Reduction was accomplished after several attempts and the joint was very stable. Spicas were worn for eighteen months with the following result: Shortening one-third inch, joint in correct position, and slight limp.

CASE XXX. Boy, nine months of age, inferior dislocation of the left hip, lengthening one inch. Abduction of fifteen degrees was present and an *x*-ray examination showed the head of the femur in the obturator foramen. A reduction was made, and the head of the bone seemed to be so firmly held in position that a spica was considered unnecessary. The patient returned in a few weeks, and it was found that the dislocation had returned. Another reduction was made and a plaster spica applied, which was worn for six weeks. An examination five months later showed the head in a normal position.

CASE XXXI. Girl, two years of age, dislocation of the left hip, shortening one-third inch. Reduction was easily accomplished and the limb placed in plaster. The acetabulum was not well formed in this case, and doubt was expressed at the time of the operation as to the outcome. Subsequent examinations, however, showed the parts in normal relation.

Although the number of these cases is small and definite conclusions cannot be drawn, there are some problems in the operation which have been demonstrated to the satisfaction of those who were engaged in the work.

The only case in which there was even an approach to an accident was No. XXI., and in this later observation showed that the operator was too

hasty in removing the spica, thereby allowing the dislocation to occur again.

At what age it is best to attempt reduction is a matter of dispute. The results obtained seem to indicate that it is wise to operate while the patient is young, and that, although a good result may be accomplished after the child is well developed, still greater improvement might have been secured had the child been seen at an earlier age. It seems pretty safe to state that development in a dislocated joint is much retarded, and that after reduction is made the whole limb grows in a normal manner.

Undoubtedly, preliminary traction lessens the amount of force necessary at the time of reduction, and should be employed in all older patients. In the cases reported above, the extreme sensitiveness which has been so often mentioned was not seen. Almost without exception, every patient could be easily handled without pain on the third day after operation; many of them moved about freely at a very early period, and in not one was there any pain after the final removal of the plaster spica.

There is one point in the application of the plaster which seems to be of importance, viz., the necessity of making firm pressure just behind the trochanter major, while the plaster can be easily moulded, as it prevents the head of the bone from slipping backward into its former position. The danger of a recurrence of the dislocation through rotation of the thigh bone can be removed by extending the spica below the knee.

The operator should not be in too much haste in trying to accomplish a reduction, as nothing is gained thereby, while, on the other hand, ill-directed force may be productive of serious results. There has been some severe criticism of the operation on account of the use of so much force; the procedure

has been termed brutal and unscientific, and in lieu of it the open operation has been advised. It is hardly necessary to state that in such a serious deformity as congenital dislocation of the hip any method of operation which holds forth the hope of such a brilliant result in a large percentage of cases, as this does, *i.e.* a perfectly normal condition, is not to be discredited too readily, and a method substituted which, at its best, offers only a partial relief.

The use of skiagrams has been found to be misleading, and often a case which seemed to present most favorable features has resulted in failure, while others which looked difficult were not so.

Paralysis has never followed any of the above operations, and it is a complication which has never been seen by me.

Summary of Results.—If the two bilateral dislocations are considered as four unilateral, the results may be summed up as follows: Whole number of hips operated upon, 33; 22, or 66 per cent. normal; nine, or 27 per cent., anterior position; two, or 6 per cent., complete failures.

It is to be noted in analyzing this work that the most of the anterior dislocations and failures occurred in the cases operated upon in the earlier part of the work. The better results obtained in the later cases were probably due to a better understanding of the necessary steps of the operation.

